970317

Georgia-Pacific LLC

133 Peachtree Street NE (30303-1847)
Atlanta, Georgia 30303
(404) 652-6166
(404) 654-4701 fax
www.gp.com

VIA ELECTRONIC MAIL

September 25, 2020

Mr. Daniel Peabody
Environmental Quality Analyst
Site Assessment Management Unit
Superfund Section
Michigan Department of Environmental Quality
Constitution Hall
525 W. Allegan Street
Lansing, MI 48020

Mr. Jim Saric
Remedial Project Manager
SFD Remedial Response Branch #1
USEPA, Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604-3590

Subject: Downstream Impact of Morrow Dam Release

Dear Mr. Peabody and Mr. Saric,

The purpose of this letter is to share data and information gathered by Wood Environment and Infrastructure Solutions, Inc. (Wood) at the request of Georgia-Pacific, LLC (GP) regarding the release of sediment and surface water from Morrow Lake. Ongoing sediment releases from Morrow Lake due to repairs of Morrow Dam have resulted in measurable sediment deposits downstream of Morrow Dam and a significant increase in concentrations of total suspended solids (TSS) and polychlorinated biphenyls (PCBs) in surface water that have migrated and continue to migrate from Morrow Lake. This release has the potential to impact Operable Unit 5 (OU5) of the Kalamazoo River Superfund Site, particularly in Area 1 of OU5, located immediately downstream of Morrow Dam. Background information and results are presented below. GP requests that the Michigan Department of Environment, Great Lakes, and Energy (ELGE) and the U.S. Environmental Protection Agency (USEPA) take specific actions, share information, and include appropriate OU5 stakeholders in future planning as discussed below.

Background

In late June 2020, it came to our attention that Eagle Creek Renewable Energy (ECRE), the company that operates Morrow Dam, initiated a drawdown in November 2019 of 9 feet and subsequently started releasing turbid water and sediment downstream into OU5. Turbid water and thick sediment deposits have been reported downstream of Morrow Dam by citizens and in published news pieces by local TV, radio, and other media outlets. Wood and GP personnel have observed turbid water

and thick sediment deposits downstream of Morrow Dam during several sampling events since June 2020.

On July 8, 2020, ELGE issued the first of two violation notices to ECRE. ECRE has submitted two responses to this violation notice and agreed to perform turbidity and new channel stability monitoring, estimation of sediment load released and changes in bathymetry, installation of engineered controls for turbidity, and preparation of monitoring, mitigation, and restoration plans. However, it is unclear when and where specifically these studies and controls have or will be implemented. On September 16, 2020, EGLE issued a second notice of violation to ECRE due to the continued and unaddressed mobilization of sediment from the Morrow Dam. EGLE documented that ECRE is the operator of a “facility” that released hazardous substances and is responsible under both Michigan Part 201 and the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In the notice EGLE requested a response plan to be submitted to EGLE by September 23, 2020 with implementation by October 7, 2020. ECRE claims that, because their activities “have not contributed to the generation, discharge or disposal of contaminants of concern (COCs),” analytical evaluation of COCs in sediment as requested by EGLE are not required. Historical sediment data from Morrow Lake, which exclude data from the previously dredged areas associated with the Enbridge oil spill and collected from 1994 to 2013, indicate concentration averages ranging from 0.33 to 0.69 mg/kg of PCBs in depth intervals of 0 to 6”, 6 to 12”, and 12 to 24” with a range of non-detect to 8.7 mg/kg in any interval. ECRE is responsible for the release of these PCBs. The final sediment remedial goal (FRG) for PCBs in Area 1 is 0.33 mg/kg.

The Morrow Dam release poses numerous concerns. Two immediate concerns include: 1) a potential increase in fish tissue PCB concentrations, and 2) an increase in dredge volume and depth in locations scheduled for removal in Area 1. A reduction of PCB concentrations in fish tissue to acceptable concentrations is the measure of effectiveness for the Area 1 remedial action. However, the Morrow Dam release has the potential to increase fish tissue concentrations regardless of the remedial actions taken in Area 1. The release may contribute to spikes in PCB concentrations in fish tissue in 2020. It may also slow the recovery of fish tissue beyond 2020. Additionally, an increase in the volume and depth of sediment removal required to implement the planned Area 1 remedy is certain. The question is how much additional sediment is present.

Surface Water - Sample Collection and Results

Surface water samples for TSS and PCB analysis were collected starting in June 2020. All samples were collected and analyzed consistent with the OU5 River-wide Quality Assurance Project Plan (QAPP) and long-term monitoring plan (LTM). Collection activities initially focused on locations up and downstream of Morrow Lake and later expanded to include locations further downstream in Area 1 and throughout OU5. Results available to date are shown in the figures below with more recently collected data not yet available. Surface water data collected in 2020 are compared to results from LTM locations along the river.

Surface water collected before and after the Morrow Dam release show increased PCB concentrations post-release of at least one order of magnitude greater than pre-release PCB concentrations. To date, surface water samples have been collected between June 26 and August 29, 2020 in post-release events at locations upstream of Morrow Lake (35th Street Bridge, LTM Station 12) and downstream of Morrow Dam (River Street Bridge, LTM Station 13). Data available to date are presented in Figure 1 with the results

for the additional events pending. Two of the events (June 26-27, July 7-8) included sampling on consecutive days. The PCB concentrations of these samples were compared with pre-release sample concentrations collected during LTM events in September of 2018 and 2019. The 2018/2019 pre-release data were selected for comparison because they represent the most recent data and were collected well after the 2013 Enbridge oil spill dredging; they are also consistent with historical data. Available data upstream of Morrow Dam and downstream of Morrow Dam show a significant increase in PCB concentrations in surface water downstream compared to samples collected pre-release (Figure 1). Mean total PCB congeners at these locations ranged from 0.594 to 5.48 nanograms per liter (ng/L) during pre-release collection events in 2018 and 2019; this range increased 10-fold upon surface water sampling post-release in 2020. In 2020 at the location downstream of Morrow Dam, the PCB concentrations in surface water ranged from 16.6 to 63.6 ng/L (Figure 1).

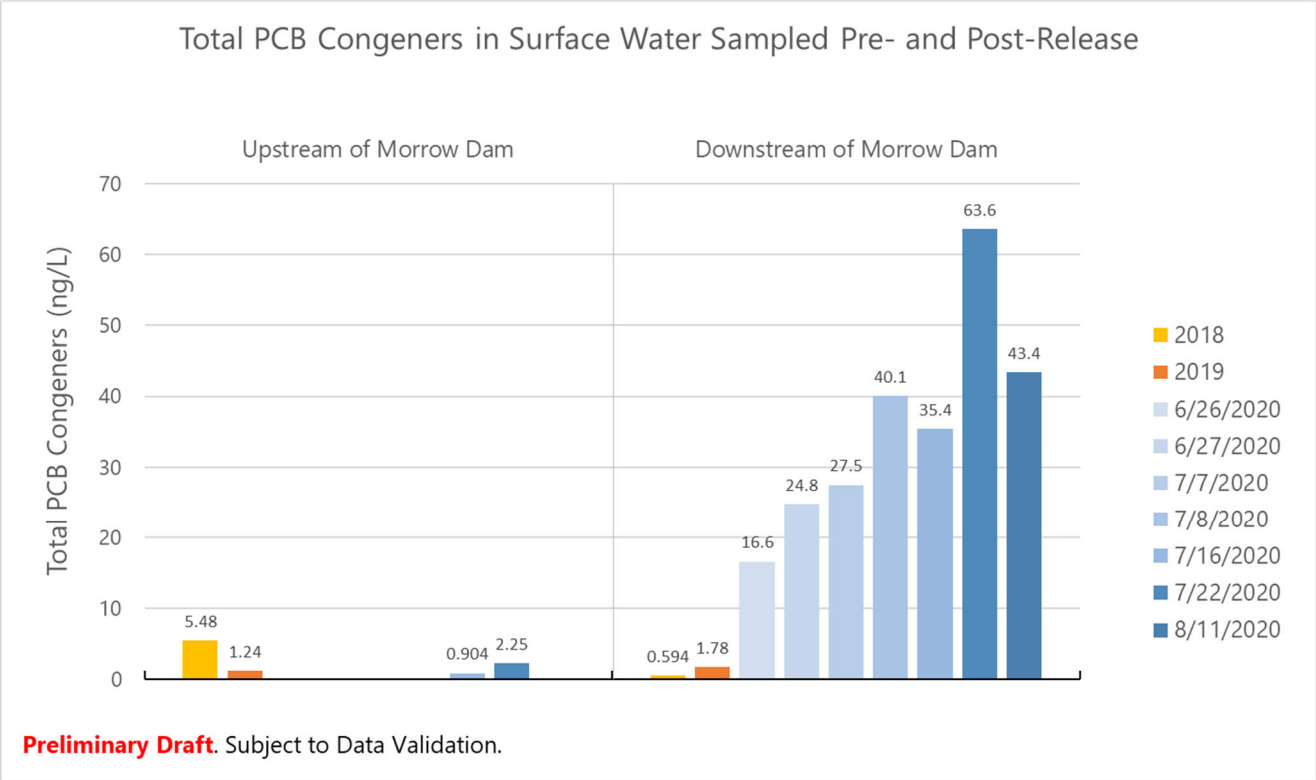

Figure 1. Total PCB congeners in surface water sampled pre- and post-release of Morrow Dam. Pre-release Total PCBs data are presented as averages from 2018 and 2019 collection events. Sampling conducted post-release include available data from events between June 26 and August 29, 2020.

PCB concentrations in 2020 remained elevated at locations farther downstream of Morrow Dam (Figure 2). On July 24, 2020, the PCB concentration was 30.6 ng/L in surface water at the former Otsego Township Dam (LTM50, ~27 river miles downstream of Morrow Dam) compared to 1.7 to 11.1 ng/L observed at this location during pre-release collection events in 2018 and 2019. These data support concerns regarding the potential for increased exposure of PCBs to fish.

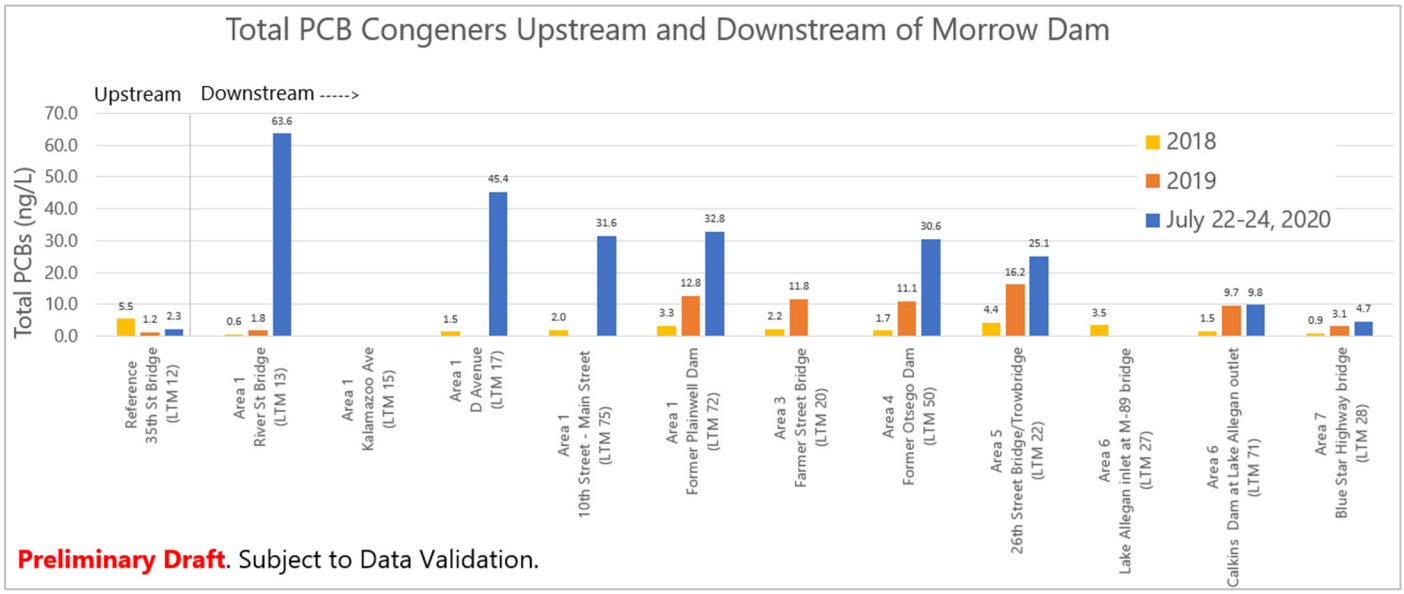

Figure 2. Analytical data available to date for PCBs in surface water samples collected at locations upstream and downstream of Morrow Dam. Locations are consistent with those identified in the LTM Sampling Plan. Pre-release data are presented as averages from 2018 and 2019 collection events. Sampling conducted post-release include data from a river-wide collection event from July 22 to July 24, 2020. Locations are organized from most upstream (left) to most downstream (right). The upstream location (LTM 12) is at the inlet of Morrow Lake. The most downstream location (LTM 28) is at Blue Star Highway Bridge.

Surface water collected pre- and post-Morrow Dam release also shows marked increases in TSS concentrations. In surface water sampled before the release from Morrow Dam, TSS ranged from 7.8 to 18 milligrams per liter (mg/L) at locations upstream and downstream of Morrow Dam. In 2020 (post-release), TSS upstream of Morrow Dam ranged from 3.6 to 10.8 mg/L, but just downstream of Morrow Dam, TSS in surface water ranged from 48 to 235 mg/L (Figure 3). TSS concentrations in 2020 remained elevated at locations farther downstream of Morrow Dam (Figure 4). On July 24, 2020, TSS was 60.4 mg/L in surface water at the former Otsego Dam, ~27 river miles downstream of Morrow Dam; significantly higher than concentrations of 8 to 20.9 mg/L observed during pre-release collection events in 2018 and 2019. These data support concerns regarding an increased and ongoing redistribution of sediment in the Kalamazoo River occurring post-release.

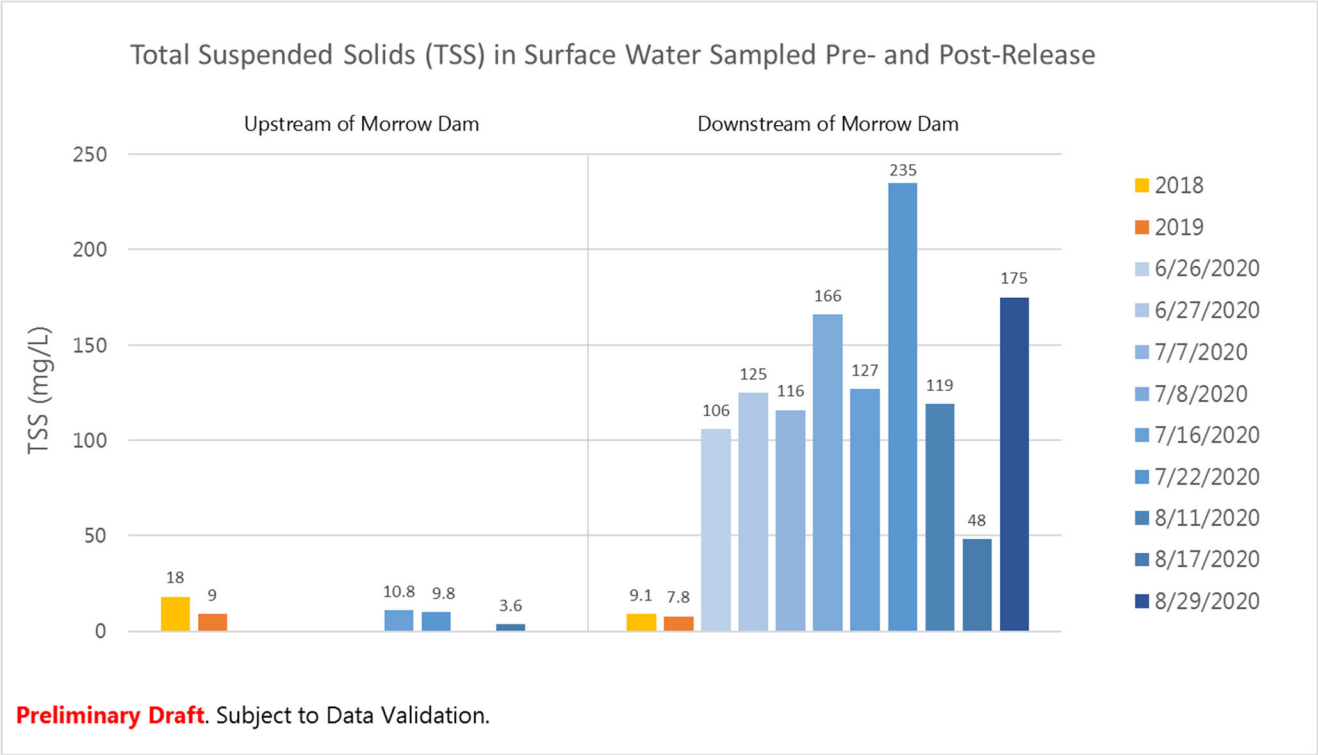

Figure 3. TSS in surface water sampled pre- and post-release of Morrow Dam. Pre-release TSS data are presented as averages from 2018 and 2019 collection events. Sampling conducted post-release include available data from events between June 26 and August 29, 2020.

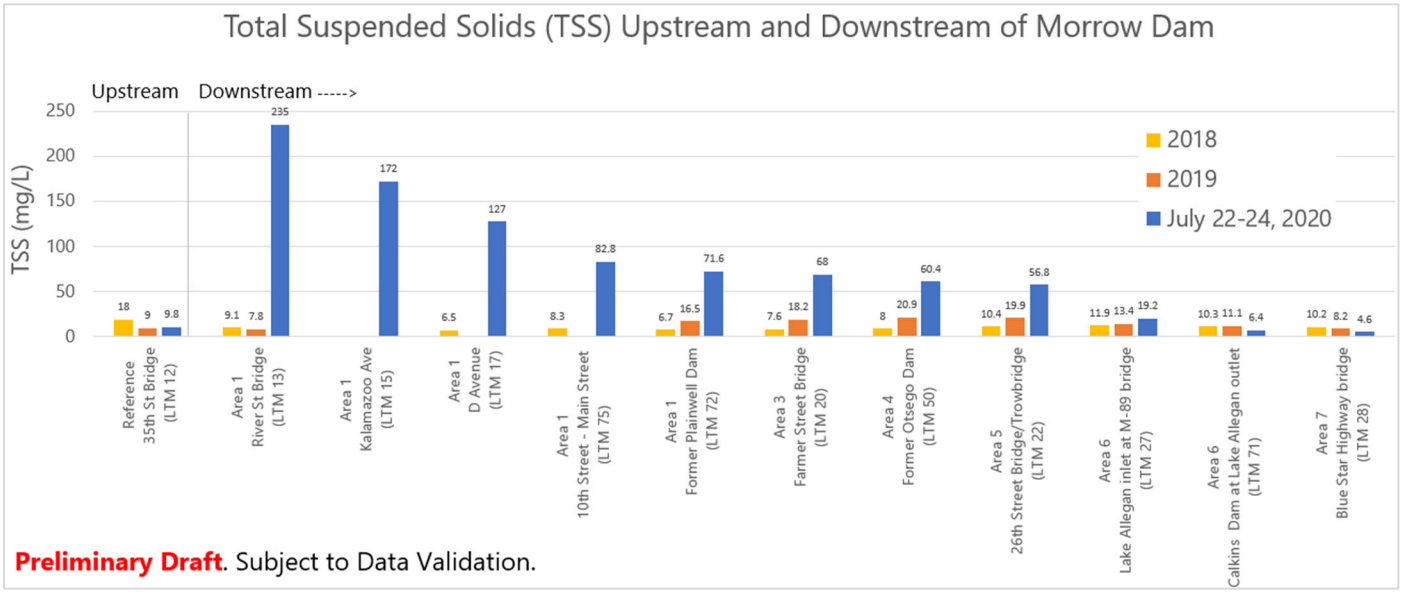

Figure 4. TSS in surface water sampled at locations upstream and downstream of Morrow Dam that were identified for sampling in the Long-Term Monitoring (LTM) Sampling Plan. Pre-release TSS data are presented as averages from 2018 and 2019 collection events. Sampling conducted post-release include data from a river-wide collection event from July 22 to July 24, 2020. Locations are organized from most upstream (left) to most downstream (right). The upstream location (LTM 12) is at the inlet of Morrow Lake. The most downstream location (LTM 28) is at Blue Star Highway Bridge.

The increased TSS and PCB concentrations in surface water downstream of Morrow Dam are significant because the increase changes the exposure of fish to sediment and PCBs in an important manner. Instead of fish exposure to sediment and PCBs at the river bed or resuspended during higher flow events, the fish have been continuously exposed to significantly increased concentrations throughout the water column since at least June 2020 when the sampling commenced and likely before this time. The post-release exposure scenario increases the likelihood that fish tissue concentrations will be impacted.

Estimates of Volume and Mass of Sediment Released

The volume and mass of sediment released from Morrow Dam were estimated and compared to pre-release estimates. Data from the U.S. Geological Survey stream gauge monitoring stations were used for flow, turbidity, and suspended solids concentration data. Additional turbidity, water level, and TSS data were available from the recent sampling events described earlier. Mathematical relationships among these parameters were developed to estimate the mass of sediment released from Morrow Dam since November 2019 as listed in Table 1. The mass of sediment released from Morrow Dam from November 2019 until the end of August 2020 was estimated as 115,000 to 190,000 tons, well above the estimate of 28,000 tons under a “no release” scenario. Similarly, estimates of sediment volume released since November 2019 were 170,000 to 280,000 cubic yards, in contrast to a no release scenario of 41,000 cubic yards. The uncertainty of these estimates stem from the inherently wide ranges of input data (e.g., river flow, suspended solids, timing of data collection events).

Parameter	No Release	Post-Release
Sediment (tons)	28,000	115,000 to 190,000
Sediment (cubic yards)	41,000	170,000 to 280,000

Table 1. Estimated loads of sediment mass (tons) and sediment volume (cubic yards) that have been released from Morrow Dam since November 2019. Estimates are subject to change as new data become available.

The estimates of volume and mass are based on models from correlations among data and, as such, uncertainty is inherent in the model and correlation estimates. Regardless of model uncertainty, the order of magnitude of the estimated increase between no release and release conditions is significant and supported by field observations and measurements.

Two elevation surveys were conducted in 2020 and were compared to pre-release elevations in Area 1.The first survey was a drone photogrammetry survey conducted in mid-August 2020 to assess the elevation of recent deposits that were not inundated, The results indicate that portions of the planned dredge prism in Area 1 have elevation increases of 1 to 5 feet, with some areas showing more than 5 feet of elevation increase. The second survey consisted of re-surveying pre-design investigation core locations in September 2020. This second survey was limited in aerial extent because boat access was not available where the water was shallow in depositional areas. Results from the

second survey show elevation increases of about 1 foot overall with greater than 3 feet of elevation gain in some locations within the planned dredge prisms. The elevation increases are significantly greater than typical average deposition rates estimated between 0.5- and 1-inch per year. These data support the conclusion that substantial amounts of sediment were released and have moved downstream.

Fish Tissue Collection

Young-of-year that survive the ongoing sediment release may reflect the elevated PCB concentrations observed in surface water and retain an elevated body burden into adulthood. Results from sampling of young-of-year smallmouth bass and rock bass in Area 1 in September 2020 will be available in late 2020.

In closing, the release of sediment and PCBs from Morrow Lake presents a realistic concern and is supported by the significant increases in TSS, PCB concentrations, and estimated sediment volume/mass which have migrated post Morrow Dam release into Area 1 and beyond. The Morrow Dam release, which is reported to persist through late 2020, will likely 1) change the baseline conditions prior to commencement of remedial action in Area 1, 2) impact the Area 1 remedial design and the remedial dredging volume and depth, and 3) impact long-term fish recovery as a measure of remedial success.

The data and information presented herein have been provided to document that an impact to human health and the environment has likely occurred. However, these data are not intended to represent the full nature and extent of the impact. GP encourages EGLE, MDNR, and USEPA to require full delineation of the impacts from the release as indicated in the September 16, 2020 second violation notice to ECRE. This effort should include a thorough bathymetric survey both up and downstream of Morrow dam spanning throughout Area 1 and beyond followed by sampling and analysis for PCBs in affected media based on the bathymetric surveys. It should also include additional measures as described in the second violation notice to mitigate mobilization of sediment within Morrow Lake and throughout Area 1. These measures are necessary to mitigate reoccurring resuspension of the deposits throughout OU5. GP, as a stakeholder in the remediation of OU5, requests that work plans and reports developed by ECRE, EGLE, or others be shared for comment with the goal of full transparency. GP also requests that data to delineate and plans of engineering controls to mitigate the impacts of the release be shared with GP. We look forward to EGLE's and USEPA's response to this request.

Sincerely,

Traylor Champion
Senior Vice President, Environmental Affairs and Product Safety
Georgia-Pacific LLC

cc: Joe Abid, Wood
Kyle Alexander, EGLE

cc: (continued)
Anita Emery-DeVisser, Wood
James Dexter, MDNR
Matt Diana, MDNR
Cynthia Draper, Wood
Richard Gay, Weyerhaeuser
Brian Gunderman, MDNR
Derek Haroldson, EGLE
David Heywood, EGLE
Bryan Heath, NCR
Shannon Johnson, GP
Brian Jones, IP
Scott Keesling, GP
David Kline, EGLE
David Massengill, GP
Keegan Roberts, CDM
Paul Ruesch, EPA
Luis Saldivia, EGLE
Theo Von Wallmenich, Jacobs
Joseph Walczak, EGLE